

On the Validity of the Name *teyahalee* as Applied to a Member
of the *Plethodon glutinosus* Complex
(Caudata: Plethodontidae): A New Name

NELSON G. HAIRSTON, SR.

Department of Biology, University of North Carolina,
Chapel Hill, North Carolina 27599-3280

ABSTRACT—The name *Plethodon teyahalee* (Hairston) cannot be applied to the member of the *P. glutinosus* complex as designated by Highton (1983). Biochemical data show that the population from which the type of *teyahalee* was taken consists of hybrids between local populations representing the *P. jordani* and *P. glutinosus* complexes, and thus cannot be applied to a member of either of those two species under Article 23(h) of the International Code of Zoological Nomenclature (1985). A new name, *Plethodon oconaluftee*, is proposed, and a new type is designated.

Plethodon glutinosus, a salamander distributed widely over the eastern United States, has recently been divided into 16 species on the basis of allozyme frequencies (Highton 1983, 1989). Most of these forms occupy non-overlapping distributions, and it is not known at present whether they are allopatric or parapatric. The form that is distributed west of the French Broad River throughout southwestern North Carolina and immediately adjacent parts of Tennessee, Georgia, and South Carolina is one of the few that overlaps any adjoining species of the complex without hybridization. In extreme southeastern Tennessee and extreme southwestern North Carolina, it overlaps *P. aureolus* and *P. glutinosus* (sensu stricto). Highton (loc. cit.) has appropriated the name *teyahalee* for this representative of the *glutinosus* complex.

In 1950 I described a form from Teyahalee Bald in the Snowbird Mountains of southwestern North Carolina as *P. jordani teyahalee*, believing it to be closely related to other subspecies of *P. jordani* (Hairston 1950). The presence of red spots on the legs of some individuals indicated the population's relationship to *P. j. shermani* of the Nantahala Mountains, and the greenish-yellow spots on the sides appeared to make it unique. Subsequent collectors have failed to find any specimens with the greenish-yellow spots, and Highton (1962), in a review of the genus, argued that they could be explained as follows: "Sometimes the lateral pigment of large specimens (of *glutinosus*) is more yellowish than in small ones, but structurally the pigment appears the same." He did not comment on the detailed differences between the white spots of *P. glutinosus* and those of

some populations of *P. jordani* figured by Hairston and Pope (1948). His conclusion was that only a representative of *glutinosus* is present on Teyahalee Bald and that it has genetically swamped a pre-existing form of *jordani* (Highton and Henry 1970); Highton 1972, 1989), using that as his justification for appropriating the name *teyahalee*.

We have known for more than 50 years that the high-altitude red-legged form of *P. jordani* and the low-altitude white-spotted form then known as *glutinosus* are hybridizing at intermediate elevations throughout the Nantahala Mountains, a short distance from Teyahalee Bald (Bishop 1941, Highton and Henry 1970). As the hybrid zone in the Nantahala Mountains is spreading toward higher elevations (Hairston et al. 1992), Highton's interpretation appears reasonable. More recently, some hybridization has been found at other localities, but not in the area between the Tuckaseegee and French Broad rivers, nor in the western two-thirds of the Great Smoky Mountains, nor in the Cheoah, Max Patch, or Sandy Mush mountains, nor in the southern 95% of the Balsam Mountains, i.e., not in more than half of the distribution of this representative of the *glutinosus* complex.

The important question is the status of the population of *Plethodon* on Teyahalee Bald. Allozyme data presented by Peabody (1978) show that these animals are intermediate between neighboring populations of *jordani* and the low-altitude representative of the *glutinosus* complex. In fact, the calculated values of Nei's Genetic Identity are more similar to the nearest populations of *jordani* than they are to the nearest populations of the *glutinosus* complex (Table 1). The genetic swamping is thus so incomplete that the entire population on Teyahalee Bald must be regarded as hybrids, and judging from the history in the adjacent Nantahala Mountains have been hybrids since at least 1938 (Bishop 1941) and probably earlier (Hairston et al. 1992).

Table 1. Genetic identities (Nei's I [Nei 1972]) among the Teyahalee Bald population, the nearest populations of the *Plethodon glutinosus* complex, and the nearest populations of the *P. jordani* complex. Note that both *jordani* and *glutinosus* are represented at Cheoah and Unicoi West. Data from Peabody (1978).

Location	Species Complex				
	<i>P. glutinosus</i>		<i>P. jordani</i>		
	Distance from Teyahalee (km)	Nei's I	Location	Distance from Teyahalee (km)	Nei's I
Cheoah	11.6	0.963	Cheoah	11.6	0.805
Unicoi West	21.8	0.694	Unicoi East	16.0	0.900
Fontana	24.0	0.941	Wayah	16.5	0.942
			Tusquitee	16.7	0.969
			Unicoi West	21.8	0.920

The situation on Cheoah requires comment. No hybridization occurs there, and the samples of the two species are therefore distinct. That representative of the *P. jordani* complex is more distantly related to the other four populations than they are to each other. The average genetic identity between it and them is 0.857 (range = 0.813–0.895); the average identity among the other four populations is 0.932 (range = 0.900–0.967). The population on Teyahalee Bald is closely related to those four representatives of *P. jordani*, but not to the Cheoah representative.

It appears, therefore, that what I described as *Plethodon jordani teyahalee* was a hybrid, and under Article 23(h) of the International Code of Zoological Nomenclature the name *teyahalee* cannot be used for that part of the *glutinosus* complex to which it was applied by Highton (1983, 1989), because that is one of the parent species. To avoid future confusion I have collected a new type for this form from an area where hybridization with *P. jordani* is unknown, and I propose the name *Plethodon oconaluftee*.

The following synonymic list is taken from Highton (1989): *Plethodon glutinosus* (Green): Brimley (1912) (part), Highton (1970) (part) [actually Highton and Henry (1970)]. *Plethodon jordani teyahalee* Hairston (1950:269). *Plethodon jordani* Blatchley: Highton (1962). *Plethodon (glutinosus) glutinosus* (Green): Bishop (1941) (part). *Plethodon teyahalee* Hairston: Highton (1984) [actually Highton 1983].

Holotype—GSMNP 33339, an adult female collected 16 May 1991, by N. G. Hairston, Sr., Pisgah National Forest, beside Forest Service Road 140 near the North Fork of the French Broad River at an elevation of 930 m on the south-facing slope of the Balsam Mountains, Transylvania County, North Carolina. Snout to posterior angle of vent, 75 mm; numerous very small white spots on back and top of tail, a few on top of head; numerous irregularly shaped white spots on sides and cheeks; underside dark throughout, including throat and chin, which have a number of irregular white spots.

Paratype—GSMNP 33340, an immature female (about 3 years old) collected in same place as the type on 17 May 1991 by M. P. Hairston. Snout to posterior angle of vent, 39 mm; dorsum, sides, head, and cheeks as for type; belly dark, throat and chin paler than in type, with many melanin-free spots, but with white pigment only in a few lateral ones. Both types have been deposited in the collections of the Great Smoky Mountains National Park.

The following diagnosis and distribution are quoted from Highton (1989), which I use because we discuss the same taxonomic entity: "*Diagnosis*: A large, light-chinned species with very small white dorsal

spots, reduced lateral spotting, and often with small red spots on the legs. The unique combination of genetic alleles that distinguishes *P. teyahalee* from other species of the *P. glutinosus* group is Pgi allele *c* and Trf allele *a* are characteristic of *P. teyahalee* populations but are usually rare or absent in the other species." (Highton 1989:54) ("*teyahalee*" used because of the direct quotation).

"*Distribution*: West of the French Broad River in the Blue Ridge physiographic province of southwestern North Carolina and in immediately adjacent Tennessee. It also occurs in northern Rabun County, Georgia, and in Oconee, Pickens, Anderson, and Abbeville counties, South Carolina." (Highton 1989:54).

ACKNOWLEDGMENTS—I thank Richard Highton for a friendly discussion of the issues involved and for suggesting the locality from which the types of *P. oconaluftee* were collected. Three anonymous reviewers made constructive suggestions.

LITERATURE CITED

- Bishop, S. C. 1941. Notes on salamanders with descriptions of several new forms. Occasional Papers of the Museum of Zoology. University of Michigan. 451:1–21.
- Hairston, N. G. 1950. Intergradation in Appalachian salamanders of the genus *Plethodon*. *Copeia* 1950:262–273.
- Hairston, N. G., and C. H. Pope. 1948. Geographic variation and speciation in Appalachian salamanders (*Plethodon jordani* Group). *Evolution* 2:266–278.
- Hairston, N. G., R. H. Wiley, C. K. Smith, and K. A. Kneidel. 1992. The dynamics of two hybrid zones in appalachian salamanders of the genus *Plethodon*. *Evolution* 46:930–938.
- Highton, R. 1962. Revision of North American salamanders of the genus *Plethodon*. *Bulletin of the Florida State Museum* 6:235–367.
- Highton, R. 1972. Distributional interactions among North American salamanders of the genus *Plethodon*. Pages 139–188 in *The distributional history of the biota of the southern Appalachians* (P. C. Holt, editor). Research Division Monograph 4. Virginia Polytechnic Institute and State University, Blacksburg.
- Highton, R. 1983. A new species of woodland salamander of the *Plethodon glutinosus* group from the southern Appalachian Mountains. *Brimleyana* 9:1–20.
- Highton, R. 1989. Biochemical evolution in the slimy salamanders of the *Plethodon glutinosus* complex in the eastern United States. *Illinois Biological Monograph* 57:1–153.

- Highton, R., and S. A. Henry. 1970. Evolutionary interations between species of North American salamanders of the genus *Plethodon*. *Evolutionary Biology* 4:211-256.
- International Code of Zoological Nomenclature, Third edition. 1985. International trust for zoological nomenclature, University of California Press, Berkeley, California.
- Nei, M. 1972. Genetic distance between populations. *American Naturalist* 106:283-292.
- Peabody, R. B. 1978. Electrophoretic analysis of geographic variation and hybridization of two Appalachian salamanders, *Plethodon jordani* and *Plethodon glutinosus*. Ph.D. Thesis. University of Maryland, College Park.

Accepted 26 March 1992